

**SUMMARY OF AMENDMENTS**

Applicant has revised the application in accordance with the O. A., and to improve the general clarity of the application as follows.

**Priority:** The claim of priority has been re-formatted and a petition is being sent to the Office of Petitions under separate cover as per the O. A.

**Abstract:** The abstract is re-submitted on a separate page as per the O. A. request, and has been revised to reflect the Division requirement of the O. A.

**Specification:** The specification is revised to reflect the O. A. requirements as to antecedent basis for claimed subject matter and to clarify certain related issues.

**Drawings:** Fig. 3 is revised to include reference numeral "04"  
Fig. 5 is revised to include reference numeral "19"  
Fig. 6 is revised to include reference numeral "04" as per O. A. request.  
Fig. 6A is revised to include reference numerals "04; 08,13; 09; 10"

**Claims:** Claims no. 1, 2, 8, 9,11,12,13,14,15,16,17,18, 19, 33, and 34 are amended.  
Claims no. 35-43 are withdrawn as per the O. A. regarding Division.  
New Claims no. 48-55 are proposed.

**APPLICANT'S RESPONSE TO OFFICE ACTION / REMARKS****APPLICANTS RESPONSE REGARDING ELECTION/RESTRICTIONS**

The applicant concedes the examiner's final ruling regarding Restriction with regard to Claims 35-43 and has deleted those claims for the purpose of this response, but maintains continuing traversal at this time. The title and abstract have been amended to reflect the restriction and replacement claims 49-55 are proposed.

**APPLICANT'S RESPONSE REGARDING PRIORITY**

The applicant intended to claim priority status based on the cited Provisional Patent Applications as was interpreted by the examiner. A petition to correct the format discrepancy is being filed under separate cover with the Office of Petitions as per the Examiners direction.

**APPLICANT'S RESPONSE REGARDING CLAIM REJECTIONS****GENERAL**

The cited references and other prior art made of record can be generally categorized as follows:

1. ***Mushroom/prong type fasteners*** having bulbous projections extending from a base which are generally dependent on distortion or elasticity of members to effect engagement:

Anderson 2499898

Eguchi et al 5586372

Flannagan 3266113

Akeno 5797170

Kayser et al 3408705

Shibanushi 5596794

Northrup 3471903

Torigoe et al 5598610

Keeler 3526867

Hattori et al 5671512

Hall 4531733

2. ***Slot and ridge type fasteners*** having rows of interengaging ridges and slots  
arrayed perpendicular to axis of engagement / shear:  
Elsenheimer 3484907  
Allan 4872242, 5088162, 5179767, 5345659, 555608
3. ***Hook-and-loop type fasteners*** having hook portions for interconnecting with loop  
portions  
Pacione 53822462  
Allan 5555608 (fig. 19)  
Kenaki et al 5655268  
Sink 5943705
4. ***Devices for attaching*** a fastener to a substrate:  
Keeler 3526867  
Northrup 3471903  
Kanzaka 4521943  
Hall 4531733  
Torigoe et al 5598610
5. ***Fasteners and structures having a fenestrated base***  
Elsenheimer 3489907  
Allan 5088162, 5179767, 5555608  
Pacione 5382462  
Akeno 5797170  
Beretta et al 5891549
6. ***Fastener portion attached to an elastic segment***  
Sink 5943705

In distinct contrast to the above, the applicant has disclosed an improved interlocking, slidingly engageable fastening device of a type which includes at least the following aspects (ref pg.2 pp.2; pg.3 pp1; pg.9 pp.2):

- Portions are *slidingly engaged* by application of a *relative shearing force*.
- Apertures and complementary islands are *effectively tapered* in at least one dimension *relative to an axis of engagement* so that a relatively loose initial juxtaposition becomes a relatively tightly contained state of engagement after application of relative shear.
- When engaged, islands are *three dimensionally contained* within respective apertures.
- And, in the present case of the subject improved fasteners, the base structure of at least one portion is *fenestrated* with undercut surfaces of islands generally aligned with and spaced from fenestrations.

By including such aspects, the present invention is unique in that:

- a.) in comparison to hook-and-loop, portions may be hermaphroditic and may be released without resistance;
- b.) in comparison to slot and ridge type fasteners, it provides a three-dimensionally interlocking connection; and
- c.) in comparison to mushroom/prong type fasteners, it provides a strong connection in shear and tension which can be released with minimal resistance.

Therefore, it can be appreciated that the present invention is significantly different in physical form, mechanism, and function from the referenced prior art. (In general, the terms *interlocking* and *slidingly engaging* as used by the applicant are intended to refer to the present type of fastener having those characteristics).

It should also be noted that the specification and claims have been modified in order to more clearly distinguish the present invention from the referenced prior art.

**RESPONSE TO SPECIFIC CLAIM REJECTIONS UNDER ARTICLE 102**

Claims 1 amended, 2 amended, 4, 8 amended, 9 amended, 12 amended, 13 amended, 15 amended, 19 amended, 20, 22, 44, 45, 47 with regard to Allan US 5555608

***Applicant's device differs from Allan in both physical form and mechanism.***

With regard to Claims 1, 12, 19, and 44 and dependent claims: Although Allan teaches a fastening device in Figs. 8, 9 which includes a fenestrated structure, a longitudinal profile which may appear somewhat similar to the applicant's Fig. 6A, and which can be said to be "slidingly engageable upon application of a relative shearing force", the present invention differs significantly in both the physical configuration of the device and the means of its engagement.

Allan (5555608 as well as in his prior patents) discloses a linear fastening device of the *slot and ridge type* (#2 above) comprising a plurality of parallel interdigitating ridges arrayed in rows perpendicular to the axis of engagement so that alternate ridges are essentially contained by the device in two dimensions, longitudinally and vertically with respect to such axis. Lateral restraint appears to be provided only by connector members 85. When "slidingly engaged" ridges 80 are contained by hook termini 82 of complementary such ridges. The "apertures" for receiving complementary ridges are each effectively defined by the "hook elements" of a *single* such complementary ridge. It would appear that, absent a consistent shearing force over the length of the fastener strap 86, the "loosely nested" ridges would be quite vulnerable to inadvertent disconnection. Although Allan suggests (but does not appear to show) providing a "tight fit" (col. 7, line 3) to solve this problem (apparently meaning a resilient or friction fit), he does not suggest any type of geometric solution which could effect a three dimensionally *interlocking* condition. Furthermore, Allan includes "connector members 85" which provide essential longitudinal structure to the device but which are effectively independent of the engaging device itself, the interengaging ridges, other than preventing lateral slippage.

In contrast, the applicant discloses an *interlocking* fastener including a plurality of islands and apertures generally having a *tapered aspect* with respect to the axis of engagement (ref: Figs. 1-7,10; pg. 2 pp.2; pg.9 pp.2; pg.14 pp.1-2; pg.15 pp.2 ) so that islands 04 (undercut segments spaced from basal surface) are effectively *three-dimensionally contained and interlocked* within complementary apertures 11 (defined by adjacent pairs of undercut segments and associated stems). Each such aperture is defined by undersides and stems of *two* adjacent islands (ref: Figs. 1-7,10; pg.14 pp.2) so as to effect the tapered aspect in respect to the axis of engagement. This tapered aspect is most apparent in plane view relative to the base structure (i.e. angular from top of page in perspective drawings). Note that, in each embodiment, aperture 11 is essentially configured so as to provide such a tapered aspect relative to the edges of adjacent islands. Therefore, when portions are engaged in the absence of a continuing shearing force, islands tend to remain essentially *interlocked* within their respective apertures until a positive counter force is applied. In further contrast with Allan, the subject invention includes a fenestrated base structure to provide longitudinal, lateral, and diagonal integrity in lieu of Allan's "connector elements" 85. Therefore it can be seen that the present invention as per the referenced claims (amended) is significantly different than that of Allan.

As to the OA rejection of claims 2, 4, 13 amended, 15 amended, 19, 20, and 22 regarding grouping of elements in 2s and 4s, Allan (Fig.8) includes an array of elements which may be said to form groups of four and to be bilateral with reference to a longitudinal vertical plane (section). Although Allan's ridges may also be said to be arranged in fours, such "fours" are simply an arbitrary division which can be selected at random without relation to the embodiment's structure. Such specific arrangements do not appear to be essential to the invention in that Allan states (pg. 6, line 58-61) that additional connector members 85 may divide ridges and in Fig. 7 shows an embodiment with portions having elements that do not appear to be "bilateral".

In contrast, the applicant teaches a device with elements arrayed in a bilateral disposition about the axis of engagement (see amended specification pg.14, pp. 1, end; pg. 17, pp. 3, line 10 ) because that arrangement of elements is an essential aspect of the invention in

each embodiment. It can be seen (Applicant's Fig. 1-7) that as each *pair* of adjacent islands is bilaterally disposed in plane view with regard to an axis of engagement as to a singular aperture, and also that in Fig. 1 each set of *four* adjacent islands are arranged in a quadrille disposition with regard to axes of engagement extending in four directions diagonal to the island edges. (Likewise triangular, hexagonal, and distinctly bilateral (only) dispositions are seen in other embodiments). It is understood that although all embodiments include pairs of adjacent elements which are bilaterally disposed in plane view, certain types of embodiments (referred to as uni-directional) as in Figs. 4, 5, 6 include elements which are bilaterally disposed only, whereas others as in Fig. 1, 2, 3, 7 have additional geometric dispositions.

Furthermore, in that many commonly known devices may include bilateral or quadrille groupings of elements, and in that the applicant teaches a device that is significantly different in configuration and function than that of Allan (per discussion above), and further in that the subject claims define or depend on claims defining such configuration and function, applicant contends that the present invention physically differs significantly from that of Allan.

In regard to Claims 8 and 9 (amended), the term "associated"( see amended specification pg. 14, pp.2, line 8) is intended to refer to the association of elements within a single portion of the subject device, primarily so as to define a difference between molded embodiments of a first type (pg. 15, pp. 3) having a singular stem per island (Claim 9), and molded or formed embodiments of a second type (pg. 16, pp. 2) having multiple stems per island (Claim 8).

Allan teaches a device which in each portion includes rows of single "stems" 92 *associated* with single "undercut segments" 82 with regard to each singular fastening surface and direction. In contrast, the applicant teaches a device generally including multiple undercut segments associated with singular stem elements with regard to equivalent directionality parameters. Claims 8 and 9 have been amended to reflect this

distinction. Therefore, it can be seen that the present invention significantly differs from that of Allan in this regard.

In regard to claims 45 and 47, Allan teaches a specific fastener of the *slot and ridge type* described above which is illustrated as being attached to a portion of footwear (Fig. 5). In contrast, the applicant teaches an example of a product incorporating a unique type of *slidingly engageable fastener* which includes a portion for “*slidingly interlocking*” and other aspects as differentiated above. Although any number of other fastening devices (including even laces or hook-and-loop) may be attached to a product, the applicant claims the unique fastener type of this invention which may be either attached or molded or formed as an integral part of the product. The present invention also has unique aspects which augment its incorporation as an integral part of a molded or formed product or product component, its unique physical form being particularly adaptable to such means of production. Therefore, the present invention can be seen to differ significantly from Allan in both its physical form and mechanism.

*Thus it can be seen that with respect to Allan, the subject claims describe a device which includes at least the following unique aspects: three dimensional containment and interlock; apertures with a tapered aspect; bilateral disposition of elements relative to a longitudinal axis; angular configuration relative to such axis; arrays of elements in pluralities directly related to form and function; association of elements relative to structure and means of production; and other distinguishing attributes of both form and mechanism.*

Claims 33 and 34 (amended) with regard to Akeno (US 5797107)

***Applicant's device differs significantly from Akeno in regard to both physical form and mechanism.***

Akeno teaches a fastening device of the “mushroom/prong type”( #1 above) which is engaged by compressing the portions so as to cause segments of the bulbous stem



fastening elements to deform or distort in order to allow engagement or disengagement.

This type of fastener appears to be intended to primarily resist stresses perpendicular to the base. The device is engaged by “resiliently bending the engaging head and the stem...”(col.2 line 67) by application of a relative compressive force (col.3 line 10-20) in lieu of being *interlocked by slidingly engaging* (by a relative shearing force), and it appears to be vulnerable to disengagement by application of a shearing stress which would cause the engaged elements to laterally bypass one another (stems of one portion slipping laterally between pairs of adjacent stems on the other portion). Therefore, the portions do not appear to be three dimensionally “interlocked”. Although it appears to include a fenestrated base with a basal surface, and a plurality of second islands defining apertures for receiving a plurality of first islands, and also include such second islands with four undercut segments spaced from one another and extending over the fenestrations, Akeno’s device provides an engagement method and physical configuration significantly different from that of the present invention.

In contrast, the applicant teaches an *interlocking* fastening device *which is not dependent on resiliency or deformation* in order to engage. Engagement is achieved by application of a relative shearing force and is maintained by the three dimensional containment of corresponding elements as explained in the specification as referenced above. Specific physical differences include the following: Applicant’s islands are arrayed so as to allow interdigitation of complementary islands without requiring distortion of elements (although a minimal amount of resilient resistance is optional); Applicant’s apertures are defined by stem walls as well as by undercut segments of islands(pg. 9 pp.2) so as to *interlockingly* limit lateral or shearing stresses; And, applicant’s apertures include openings which are larger in at least one dimension than the leading edge of complementary islands( Pg. 2 pp.2 ) so as to allow islands to be readily received in the provided apertures. Therefore, the applicant’s invention is clearly not anticipated by Akeno.

Claims 25, 26, 28, and 29 with regard to Hall (US 4531733)

***Applicant's device differs significantly from Hall in both physical form and mechanism.***

Hall teaches a fastening device essentially of the “*mushroom/prong*” type with a second basal surface which also includes a plurality of extending attachment devices, “back prongs 224” . Engagement of the fastener is described as a two step process of compressing tapered prongs with stepped bulbous elements into receiving apertures defined by “*four opposing prongs*” (col.6 line 52). Therefore the device does not appear to be “slidingly engageable” (as defined by applicant on pg. 3 pp.1) in that only a compressive force would appear to engage the prongs by resiliently distorting the bulbous ridges – and further in that Hall specifically states that the device is intended to release when a significant shearing force is applied (col. 3 line 38).

In contrast, the applicant discloses a *slidingly engageable fastener* (pg.3 pp.1) which includes *apertures defined by sets of two adjacent islands*. Islands comprise an upper portion with segmented undersides which are not vertically stepped as in Hall. Engagement is achieved by slidingly engaging islands into respective apertures and the device is resistant to continuing shear stresses (pg. 2 pp.2). Although both devices include attachment “prongs” extending from the second basal surface (as do numerous other products as in Torigoe US 5598610) applicant's Claims 25, 26, 28 and 29 are each specifically limited to a *slidingly engageable fastener ..wherein sets of two adjacent first islands each define an aperture*. Therefore, the applicants invention is distinctly unique and clearly not anticipated by Hall.

Claims 25, 27 and 28 with regard to Keeler (US3526867)

***Applicant's device differs significantly from Keeler in both physical form and mechanism.***

Keeler teaches an electrical connector with another mechanism of the *mushroom/prong type* which is designed to engage by aligning and intermeshing sets of bulbous pins, certain of such pins intended to “flex” laterally (col. 3 line 25) in order to receive opposing pins. In respect to the mechanism of engagement, the device is similar to Hall (above) as well as Akeno and others of this type which are *compressed* rather than *slidingly engaged* (as defined by the applicant pg.3 pp.1). Keeler also includes a means for attaching the connector portion to a substrate by rivets. The attachment devices (rivets) appear to be independent of the connector structure itself and do not appear to extend from or to be in any way integral with the basal structure.

As with Hall(above) the present invention is distinctly different from Keller in both physical form and function. Applicant specifically claims a “*slidingly engageable fastener*” having “...sets of two adjacent... islands” which “...define an aperture”, and with diverse attachment devices as per the subject dependent claims. Additionally, applicant teaches such attachment means which *extend from and are integral with the basal structure* of the fastener. Therefore, the present invention can not be anticipated by Keeler.

Claim 31 with regard to Keyaki et al (US 5655268)

***Applicant’s device differs significantly from that of Keyaki in both physical form and function.***

Keyaki teaches a *hook-and-loop type* fastener portion attached to a substrate by a thread sewn through a first portion of the fastener base, the substrate, and a second portion of the fastener base which is structurally connected in a “c” shaped configuration from the first portion. so as to “sandwich” an edge of the substrate. The hook-and-loop fastener appears to comprise a plurality individual hooks designed to connect with a plurality of individual loops in an essentially random pattern and do not appear to provide apertures when combined in pairs or in any other particular grouping.

In contrast, the applicant teaches a specific fastener type having the islands and apertures described in the specification ( pg. 14, ref. pg.20 pp.1 line 1) and drawings (i.e. Figs. 1 and 8). The fastening device as described in Claim 31 is clearly not descriptive of a hook-and-loop type of fastener, specifically in that “*adjacent pairs of ...islands define an aperture...*”, and in that the term “*island*” is not descriptive of either a “*hook*” or a “*loop*” as those terms are commonly understood in the field. The referenced “backing structure” is shown in Fig. 8 as an independent structure not necessarily contiguous with the fastener’s base (though such a structural continuity is not intended to be precluded). It is readily apparent that a fastening device of the general type of this invention can be sewn (or chemically adhered) to a substrate ( pg. 10 pp.2 last sentence) and that such a substrate may also include a backing structure. Therefore, the applicant’s invention is distinctly different in both physical form and mechanism from that of Keyaki.

***Thus it can be seen that the present invention includes numerous physical and functional aspects which clearly differentiate it from the referenced prior art. In that it is the applicants understanding that article 102 requires only that an invention include a single distinct physical aspect differentiating it from the prior art, applicant contends that the subject invention therefore clearly meets the test of “novelty” under article 102 in regard to the rejected claims (as amended).***

**RESPONSE TO SPECIFIC CLAIM REJECTIONS UNDER ARTICLE 103**

Claims 6, 17amended, and 24 with regard to Allan (US 5555608) in view of Allan (US 4872242)

***Applicant's invention is not obvious from the cited patents by Allan.***

Allan's earlier patent (US 4872242 ) teaches a fastener of the *slot and ridge type* (Fig. 10, col.4 lines 48-59) with chevron shaped ridges "teeth 413" apparently intended to *resiliently engage* with complementary "grooves 460" by application of a relative compressive force so as to physically distort the "trapezoidal cross section shapes" (col.4 line 49) so that those cross sectional shapes are "incorporated into the valleys between the teeth..." (...line 58) The chevron configuration is indicated as to "block lateral sliding of the end portions of the connector"(...line 54), therefore the outside ends of interengaging islands are not otherwise restrained laterally. It is apparent that the fastener is designed to provide bi-directional (on longitudinal axis) shear resistance and to be reasonably resistant to lateral movement, but that it can only be provided as two distinct portions.

In his more recent patent (US 5555608), Allan teaches a modified *slot and ridge type* of fastener (Figs. 8,9) which includes double ended interengaging ridges 80 with double ended "hook termini 82, 83 oriented in opposite directions" in relation to opposing surfaces. These ridges are further arrayed laterally in opposite facing pairs so as to also oppose bi-directional longitudinal shear. Lateral slippage in this device appears to be limited only by "connector members 85" resisting the lateral ends of hook termini 82, 83. As shown in sectional view (Fig.9 ), the hook termini are designed to extend into the receiving space between complementary ridges so that the ends of such ridges are accordingly restrained by the connector members. It should be noted that Allan's hook termini extend only slightly above the surface of surrounding connector members, apparently so that such lateral ends may be restrained by the "connector members" in order to provide lateral resistance. In a further embodiment (figs. 13,14) Allan utilizes

another set of slot and ridge fasteners for lateral restraint in lieu of such connector elements but suggests no angular shape. Therefore Allan provides a *slot and ridge type* of fastener effectively utilizing side rails for lateral constraint.

On the other hand, the applicant teaches (Fig. 6, pg. 19 pp.2) an interlocking slidingly engaged fastener which comprises a plurality of undercut islands 04 arrayed in bilateral disposition along their longitudinal axis in a chevron configuration in which islands of a first directional orientation extend beyond the first side of a fenestrated basal structure, and islands of an opposite directional orientation extend beyond a second side of such base structure. Thus the invention provides a fastener resistant to *uni-directional* shear which can be interlocked with another portion of itself on the opposing surface. It should be noted that island undersides are spaced from the surface so that lateral restraint is provided only by the unique three-dimensional containment of effectively tapered islands within complementary apertures as provided by the chevron-like shape.

It is apparent that Allan's proposal of a chevron configuration was related only to his nesting "c shaped" ridges mounted on a contiguous base as in US 4872242; and that his diverse strap fasteners incorporating a fenestrated base are related only to his hook type ridges arrayed perpendicular to the longitudinal axis of shear as in US 5555608. It is also apparent that in both of the cited cases Allan's device is decidedly intended to resist bi-directional shear and to be effectively engaged by a compressive force.

Therefore, the applicant asserts that the invention as described in Claims 6, 17, and 24 is patentable under article 103 in that it is not obvious relative to the combined Allan citations for the following reasons:

1. The result achieved by the invention is new and superior in that a fastener is provided which: a.) is not dependent on resilience to maintain engagement and is therefore not subject to release by deformation, but at the same time can be readily released by reversing the direction of relative shear; and b.) includes portions which are laterally restrained by the engagement element itself without

requiring restraining rails (connector members) extending laterally beyond the effective width of the arrayed fastening elements.

2. Those skilled in the art (i.e. Allan with at least five patents in the field) have failed to develop a slidingly engaged uni-directional chevron shaped fastener with a fenestrated base. In his most recent patent and others cited (which appear to provide advances in the field) Allan neither shows nor suggests any type of chevron configuration in combination with a fenestrated base structure. It is therefore a unique inventive step to provide such a device as in the present invention.
3. Although Allan recognizes the problem of lateral restraint in his earlier patent (US 4872247 col. 4, line 57), US 5555608 clearly depends on longitudinal "connector members" as well as longitudinal "nesting ridges" in another embodiment (Figs. 13, 14). Applicant's invention solves the problem without such additional aspects.
4. The present invention provides a significant step in a relatively crowded art. A large number of inventions in the field of surface fasteners have not heretofore included the subject inventive step, therefore it should be considered as a significant development.
5. The referenced prior art lacks any suggestion that the references should be combined in the form of the present invention. Although Allan (US 4872247) suggests the chevron shape to resist lateral movement (col.4, lines 48-59), there is no suggestion in the later patent that this form should be combined with his later invention. Allan does suggest a uni-directional strap in US 5555608 (col.7 lines 13-17) but does not suggest a chevron shape (even though he previously included such a shape).
6. The prior art in both cases teaches a bi-directional fastener, whereas in contrast the present invention teaches a uni-directional strap.
7. The Applicant's invention provides a new principle of operation in that it is a slidingly engageable fastener not dependent on connector members to provide lateral constraint and which is also not dependent on deformation of elements in order to engage, disengage, or maintain engagement.

8. Despite the fact that the two citations appear to be by the same person, no suggestion is made in either that the aspects of the subject inventions should be combined.
9. If the references were to be combined either by arraying ridges of opposing orientations in a chevron shape, or by providing a resilient set of oppositely hooked ridges with side rails, the result would be an inoperative combination: wherein 1.) a chevron shaped strap having bi-directional elements in either a side by side or top and bottom distribution would appear to result in elements interfering with one another so as to prevent engagement or 2.) elements of sufficient resilience to allow engagement would as readily disengage or would laterally slide apart.
10. The references each provide a fastening device of distinct type which are each complete and effective on their own.

Claim 46 with regard to Allan (US 5555608) in view of Sink (US 5943705)

***Applicant's invention is not obvious from the cited patents by Allan and Sink.***

Allan teaches a fastening strap of the *slot and ridge type* which is thoroughly differentiated from the present invention in the discussion above. His device does not include nor appear to suggest an elastic segment. Although Allan does appear to recognize the problem of inadvertent disconnection of a *non-interlocked* fastener in that he suggests incorporating a sealed bladder (Fig. 5, 55, col.6 line 17) he does not suggest an elastic segment. Even though Allan's device would appear to benefit from inclusion of such an elastic section as a means for maintaining engagement in lieu of providing a three-dimensional interlock, there does not appear to be any suggestion of such a device in his specification.

Sink incorporates an elastic section in conjunction with a double sided *hook-and-loop type* strap fastener. Sink states that the elastic section is intended to provide a



“...comfortable and flexible fit...” (col. 2 line 60) and “...firmer attachment...” (col. 2 line 65). The effect of such elastic portion appears to be unrelated to the fastener mechanism itself which is a simple press-together connection.

In contrast to both Allan and Sink, the present invention teaches a “*slidingly engageable...slidingly interlocking...*” (claim 44) fastener portion of a product which may also include an elastic section elsewhere (as along a strap). In the present invention, such an elastic section may provide continuing tension on the connection as required for a particular application as in Sink. However it *has the additional effect of providing an initial relative shearing force therefore causing the fastener portions to slidingly engage and interlock* (pg. 21 pp. 2, line 10-13) after they are initially aligned. Applicant agrees with the Examiner that providing a fastening strap with an elastic portion as in Sink may not be in and of itself unique. However claim 46 specifically limits the subject elastic portion to a product having the unique attributes of the invention as differentiated from Allan in detail above. Therefore, the present invention is not obvious relative to Allan in view of Sink for the following reasons:

1. The result achieved by the invention is new and superior in that the elastic section causes interlocking engagement in addition to providing continuing tension which is a result not suggested by Allan or Sink or foreseen by a combination of both.
2. Those skilled in the art (i.e. Allan), although apparently recognizing the problem solved by the present invention as it relates to Allan’s bladder mechanism, failed to recognize, appreciate the advantage, or suggest the solution of an elastic segment.
3. The invention represents a significant step forward in a relatively crowded art.
4. The present invention provides a simpler, more effective, and presumably less costly alternative to the complex multi-part assembly of Sink in that adjustable fastener portions may be integrally molded as part of the product. Further, the present invention can provide superior strength and other advantages of such

- slidingly engageable interlocking fasteners as per the specification (i.e. pg.2, pp.2).
5. The prior art lacks any suggestion that either reference should be modified in the manner of this claim or that they be combined in the manner suggested.
  6. The applicant includes the elastic segment as part of a new and unique type of fastener which utilizes a new principal of operation (slidingly engaging /interlocking of three dimensionally tapered elements).
  7. Applicant's invention solves a different problem than that identified by Sink or Allan in that the elastic segment also aids in the operation of the fastening device. With regard to Allan, the elastic segment would work in opposition to half of engaging devices which are oriented in opposing directions. With regard to Sink, excessive shear tends to weaken a hook-and-loop connection.
  8. Even if combined, the references would not meet the claim in that such claim includes fastener portions which are "slidingly engaged and... interlocked".
  9. The result achieved by the invention is greater than that suggested by the combined references in that the elastic section provides both a relative shearing force to cause engagement and continuous tension on the part (strap) to a desired degree after such engagement.
  10. If combined, the references would result in an unworkable combination in that an elastic segment applied to Allan would counteract the half of engaging elements oriented in a direction opposing such elastic segment.

Claim 30 with regard to Keeler (US 3526867) in view of Kanzaka (US 4521943)

***Applicant's invention is not obvious from the cited patents by Keeler and Kanzaka.***

Keeler teaches an electrical connector utilizing a fastening device essentially of the *mushroom/prong type* in which a plurality of prong like elements are interengaged by application of a *relative compressive force* (as discussed above). Apertures for receiving

and containing such prongs are each defined by sets of *at least three* such prongs on the receiving portion. *Rivets* are indicated as attachment means.

Kanzaka teaches a garment fastener comprising a *singular* “hook and eye” which includes spikes extending from a second surface intended for attachment by penetrating through a fabric substrate and thence folding over a hasp portion. It should be noted that other known means of attachment such as common staples also include similar such folding devices (without the hasp).

In contrast, the applicant teaches specifically a *slidingly engageable fastener* (as defined in specification pg. 3 pp.1) with a *plurality* of fastening elements having apertures defined by “sets of *two* adjacent ... first islands” which also includes a plurality of folding devices extending from a second basal surface (Fig. 9e). The “folding devices” are not indicated as requiring inclusion of a secondary “hasp” (although such a device is not precluded). It should be noted that Claim 30 specifically limits such folding devices to the *slidingly engageable* fastening device of Claim 25. While numerous other mechanisms such as the aforementioned staples may be described as including “folding devices”, Claim 30 as so restricted is clearly novel in that it applies specifically to the unique type of slidingly engageable fastener of the invention. Thus, the present invention is not obvious for the following reasons:

1. The problem solved by the present invention, i.e. attaching a *slidingly engageable* fastener comprising a plurality of engaging elements of the type disclosed to a substrate has not been recognized in the prior art in that such a type of fastener has not been known.
2. The present invention is contrary to the prior art in that: a.) it teaches a *slidingly engageable* fastener in contrast with Keeler; and in that b.) it teaches a fastener with a *plurality* of elements in contrast with Kanzaka.
3. The present invention includes a new principle of operation, i.e. a *slidingly engageable* fastener as described, in contrast with previously known fastener technologies such as interengaging prongs or singular hooks and eyes.

4. A combination of the referenced inventions as suggested would result in a compressively engaged type of electrical connector attached to a (fabric) substrate by folding spikes with an associated hasp, or would result in a singular hook and eye type connector attached to an electrical circuit board. In contrast, the present invention includes a significantly different type of fastening device which may be attached to diverse substrates.
5. There is no suggestion in either Keeler or Kanzaka that their inventions should or could be combined.
6. The referenced inventions represent nonanalogous art, i.e multi-circuit electrical circuit board connectors and singular point garment fasteners.
7. The references are each complete and functional in themselves in that Keeler provides an electrical circuit board connector attached by rivets and Kanzaka provides a garment fastener attached by a set of folding prongs and associated hasp.
8. Even if combined as suggested by the examiner, the references would not provide a *slidingly engageable fastener... wherein sets of two adjacent... islands each define an aperture... attached to a substrate by folding devices (without a hasp) as per the claim in question.*

**REGARDING ALLOWABLE SUBJECT MATTER PER THE OA****(Claims 3, 5, 7, 10, 11, 14, 16, 18 amended , 21, 23 and 32):**

Based upon the proposed amended claims and the discussion above, the applicant maintains that the subject claims should not require amendment if the base claims as amended are accepted. Claim 18 has been amended for clarification.



**CONCLUSION**

In light of the discussion above and the proposed amendments to the specification, drawings, and claims, and also in light of the prior art made of record, the applicant submits that the application as amended is in proper form and is now in condition for allowance.

**CONDITIONAL REQUEST FOR CONSTRUCTIVE ASSISTANCE**

If for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. 2173.02 and 707.07(j).

Respectfully Submitted this 19th day of June, 2003

**Leonard Duffy**, Applicant, Pro Se

P.O. Box 99

Hinesburg, VT 05461

Phone 802 482 3040 / fax 802 482 3490 email [lduffy@wcvt.com](mailto:lduffy@wcvt.com)

**RECEIVED**  
JUN 24 2003  
**GROUP 3600**